CLAIMS

1. A graft connector kit, comprising

a graft connector comprising

a sleeve (10), which has an opening (12) in its circumferential surface and comprises a memory material, and

a collar (11) which consists of a fluid-tight material and is fixed to the sleeve (10) before use of the graft connector and which has, on the one hand, a shoulder portion (13) extending at least around the opening (12) in the circumferential surface of the sleeve (10) and, on the other hand, a neck portion (14) integral with the shoulder portion (13) and projecting radially from the opening (12) in the circumferential surface of the sleeve (10), and

removable means (31; 42; 46) for temporarily reducing the diameter of the sleeve (10) during insertion into a blood vessel (2).

2. A graft connector kit as claimed in claim 1, wherein the removable means (31; 42; 46) comprises a suture (31) encircling at least part of the sleeve (10) and thereby reducing the diameter of the sleeve (10).

3. A graft connector kit as claimed in claim 2, further comprising edge means (20, 34, 35) for cutting the suture (31) once the sleeve (10) is introduced into the blood vessel (2),

whereby the memory material is allowed to expand the sleeve (10).

4. A graft connector kit as claimed in claim 3, wherein the edge means (20, 34, 35) comprises a needle (20) having an edged hole (34, 35) at a tip thereof, through which hole the suture (31) is extending.

5. A graft connector kit as claimed in claim 4, further comprising two L-shaped elements (18, 19);

first releasable means (20, 21, 28-30) for locking the two L-shaped elements (18, 19) together so as to form a T-shaped element (26) having a stem (27) and two oppositely directed arms (24, 25); and

second releasable means (31; 42; 46) for connecting the arms (24, 25) of the T-shaped element (26) along the sleeve (10) of the graft connector,

whereby the sleeve (10) may be introduced into the blood vessel (2) through the longitudinal incision made therein by manipulation of the stem (27) of the T-shaped element (26) and the two L-shaped elements (18, 19) may be released from each other and from the sleeve (10) and then retracted from the blood vessel (2).

6. A graft connector kit as claimed in claim 5, wherein the suture (31) encircles at least part of the sleeve (10) and the arms (24, 25) of the T-shaped element (26).

7. A graft connector kit as claimed in claim 5, wherein the T-shaped element (26) has a longitudinal channel (29) in which the needle (20) is positioned.

8. A graft connector kit as claimed in claim 7, wherein the needle (20) is retractable from the longitudinal channel (29) of the T-shaped element (26) and has a cap (21) enclosing the free ends of the stem (27) in its non-retracted position.

9. A graft connector kit as claimed in claim 8, wherein the needle (20) and the cap (21) is locking the two L-shaped elements (18, 19) to each other.

10. A graft connector as claimed in claim 9, wherein the opening (12) in the circumferential portion of the sleeve (10) is unsymmetrically positioned relative to the ends of the sleeve (10).

11. A graft connector kit as claimed in claim 9, wherein the sleeve (10) consists of a net-like material.

12. A graft connector kit as claimed in claim 1, wherein the sleeve (10) consists of a stent material.

13. A graft connector kit as claimed in claim 1, wherein the collar (11) consists of an elastic material.

14. A graft connector kit as claimed in claim 1, wherein the shoulder portion (13) of the collar (11) is attached to the outside of the sleeve (10).

15. A graft connector kit as claimed in claim 14, wherein the shoulder portion (13) fully encompasses at least part of the sleeve (10).

16. In combination, a T-shaped graft connector comprising

a sleeve (10) that is to be introduced into a blood vessel (2) through a longitudinal incision made therein, the sleeve (10) having an opening (12) in its circumferential surface and a collar (11) adjoining the opening (12) and extending radially therefrom and, when the sleeve (10) is introduced into the blood vessel (2), extending out from the longitudinal incision made therein;

and an introducer comprising

two L-shaped elements (18, 19),

first releasable means for (20, 21, 28-30) locking the two L-shaped elements (18, 19) together so as to form a T-shaped element (26) having a stem (27) and two oppositely directed arms (24, 25), and

second releasable means (31; 42; 46) for connecting the arms (24, 25) of the T-shaped element (26) along the sleeve (10) of the graft connector,

whereby the sleeve (10) may be introduced into the blood vessel (2) through the longitudinal incision made therein by manipulation of the stem (27) of the T-shaped element (26) and the two L-shaped elements (18, 19) may be released from each other and from the sleeve (10) and then retracted from the blood vessel (2).

17. A method of connecting a T-shaped graft connector to a blood vessel (2),

said T-shaped graft connector comprising a sleeve (10) that is to be introduced into the blood vessel (2), the sleeve (10) having an opening (12) in its circumferential surface and a collar (11) adjoining the opening (12) and extending radially therefrom,

said method comprising the steps of

locking a T-shaped element (26) having a stem (27) and two oppositely directed arms (24, 25) to the sleeve (10), the sleeve (10) extending along the arms (24, 25) and the collar (11) extending substantially along the stem (27),

reducing the diameter of the sleeve (10),

making a longitudinal incision in the blood vessel (2),

inserting the sleeve (10) through the incision into the blood vessel (2) using the stem (27) as a holder, the collar (11) extending radially out of the incision in the blood vessel (2),

releasing the sleeve (10) from the T-shaped element (26) to allow the sleeve (10) to expand within the vessel (2), and

removing the T-shaped element (26) from the blood vessel (2).

18. A method of making a branch connection to a blood vessel, using

a T-shaped graft connector (10-14) comprising a sleeve (10) that is to be introduced into the blood vessel (2), the sleeve (10) having an opening (12) in its circumferential surface and a collar (11) adjoining the opening (12) and extending radially therefrom, and

a T-shaped element (26) having a stem (27) and two oppositely directed arms (24, 25),

said method comprising the steps of

locking the T-shaped element (26) to the sleeve (10) such that the sleeve (10) extends along the arms (24, 25) and the collar (11) extends substantially along the stem (27),

reducing the diameter of the sleeve (10),

making a longitudinal incision in the blood vessel (2),

inserting the sleeve (10) through the incision into the blood vessel (2) using the stem (27) as a holder, the collar (11) extending radially out of the incision in the blood vessel (2),

releasing the sleeve (10) from the T-shaped element (26) to allow the sleeve (10) to expand within the vessel (2), and

removing the T-shaped element (26) from the blood vessel (2).

19. A method of making a branch connection to a blood vessel, using

a T-shaped graft connector (10-14) comprising a sleeve (10) made from a memory material, which sleeve (10) is to be introduced into the blood vessel (2), the sleeve (10) having an opening (12) in its circumferential surface and a collar (11) adjoining the opening (12) and extending radially therefrom, and

a T-shaped element (26) having a stem (27) and two oppositely directed arms (24, 25), the diameter of the sleeve (10) being reduced by a releasable locking of the sleeve (10) along the arms (24, 25) of the T-shaped element (26), the

collar (11) extending substantially along the stem (27) of the T-shaped element (26),

said method comprising the steps of

making a longitudinal incision in the blood vessel (2),

inserting the sleeve (10) and the arms (24, 25) of the T-shaped element (26) through the incision into the blood vessel (2) using the stem (27) as a holder, the collar (11) extending radially out of the incision in the blood vessel (2),

releasing the sleeve (10) from the T-shaped element (26) to allow the sleeve (10) to expand within the vessel (2), and

removing the T-shaped element (26) from the blood vessel (2).

20. A method as claimed in any one of claims 17-19, wherein the locking of the T-shaped element (26) to the sleeve (10) comprises at least partly encircling the sleeve (10) and the arms (24, 25) with a suture (31).

21. A method as claimed in claim 20, wherein the sleeve (10) is released from the T-shaped element (26) by cutting the suture (31).

22. A method as claimed in any one of claims 17-19, wherein the locking of the T-shaped element (26) to the sleeve (10)

comprises inserting each one of the arms (24, 25) and an adjoining part of the sleeve (10) into a tube (42) made of a plastic film and then shrinking the tube (42) thereby also reducing the diameter of the sleeve (10).

23. A method as claimed in 22, wherein the sleeve (10) is released from the T-shaped element (26) by a longitudinal cut through the tube (42).

24. A method as claimed in any one of claims 17-19, wherein the locking of the T-shaped element (26) to the sleeve (10) comprises making a tube of each one of the arms (24, 25) and a sheet (46) of a plastic film, said tube encircling an adjoining part of the sleeve (10), and reducing the diameter of the sleeve (10).

25. A method as claimed in claim 24, wherein the diameter of the tube is reduced by shrinking of the plastic film (46) after the tube is made, whereby the diameter of the sleeve (10) is reduced.

26. A method as claimed in claim 25, wherein the diameter of the sleeve (10) is reduced at the same time as the tube is made.